

State of Colorado
Oil and Gas Conservation Commission

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Received 12/07/2015
Project 9385
Remediation 200438211
Spill 438253
Document #: 2210528

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☒ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☐ Other (describe):

GENERAL INFORMATION

OGCC Operator Number: 47120		Contact Name and Telephone	
Name of Operator: Kerr-McGee Oil and Gas Onshore, LP		Name: Phillip Hamlin	
Address: 1099 18th Street, Suite 1800		No: 970-336-3500	
City: Denver State: CO Zip: 80202		Fax: 970-336-3656	
API/Facility No: 438253	County: Weld		
Facility Name: Warren	Facility Number: 63N67W29NESE		
Well Name: Warren	Well Number: 29-9L		
Location (QtrQtr, Sec, Twp, Rng, Meridian): NESE S29 T3N R67W		Latitude: 40.195527	Longitude: -104.906045

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.):	Crude Oil and Produced Water
Site Conditions: Is location within a sensitive area (according to Rule 901e)?	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N If yes, attach evaluation.
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.):	Crop Land
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan:	Coarse sand, gravel/river rock
Potential receptors (water wells within 1/4 mi, surface waters, etc.):	The nearest surface water is located approximately 105' west of the site. The nearest water well is located approximately 742' south of the release area.
Description of Impact (if previously provided, refer to that form or document):	
Impacted Media (check):	Extent of Impact:
<input checked="" type="checkbox"/> Soils	15' (E-W) x 15' (N-S) x 19' bgs
<input type="checkbox"/> Vegetation	
<input checked="" type="checkbox"/> Groundwater	See attached data
<input type="checkbox"/> Surface water	
How Determined:	Excavation, soil sampling, and laboratory analysis
	Groundwater sampling and laboratory analysis

REMEDIALATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

On July 15, 2014, historical hydrocarbon impacts were discovered during replacement of the produced water sump at the Warren 63N67W29NESE production facility. The volume of released material is unknown. The well was shut in, associated underground infrastructure removed, and excavation activities commenced. Groundwater was not encountered in the excavation. An Initial Form 19 was submitted to the COGCC on July 18, 2014 (COGCC Document No. 400646026), and a Supplemental Form 19 was submitted on July 25, 2014 (COGCC Document No. 400649221). The COGCC has issued Spill Tracking Number 438253 for this release.

Describe how source is to be removed:

On July 15, 2014, excavation activities commenced and approximately 290 cubic yards of impacted material were excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Excavation activities were guided in the field using a photoionization detector (PID) to measure volatile organic compound (VOC) concentrations in soil. Soil samples were collected from the sidewalls and base of the final extent of the excavation area at approximately 10 and 19 feet below ground surface (bgs), respectively. Soil samples were submitted to eAnalytics Laboratory in Loveland, Colorado for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by USEPA Method 8260, TPH - diesel range organics and oil range organics (DRO and ORO) by USEPA Method 8015. Laboratory results indicated that constituent concentrations in the soil samples collected from the final lateral extent of the excavation area were below applicable COGCC Table 910-1 standards. Benzene and TPH concentrations in the base sample (B01@19) were above the applicable COGCC Table 910-1 standards. Additional excavation was not completed due to unstable soils, and groundwater was not encountered in the excavation area. The excavation was subsequently backfilled and re-contoured to match pre-existing conditions; impacted soil was left in place to be addressed by future in-situ remediation. Soil analytical results are summarized in Table 1. Soil sample locations are illustrated on Figure 1 and laboratory analytical reports are included as Attachment A.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

Impacted soil was excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado. Impacted soil left in place at the base of the excavation will be treated using in-situ remediation technologies. Groundwater monitoring and remediation measures are described on the following page.

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Received Date: _____
Well Name & No: _____
Facility Name & No.: _____

REMEDIATION WORKPLAN (CONT.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

On March 27, 2015, three temporary groundwater monitoring/remediation wells (BH01-BH03) were installed at the site to assess the extent of potential groundwater impacts. Groundwater samples are collected on a quarterly basis from the temporary monitoring wells and analyzed for BTEX by USEPA Method 8260; the most recent samples were collected on October 14, 2015. Temporary monitoring/remediation well locations and groundwater analytical results are illustrated on Figure 2, and a groundwater contour map, based on data collected on July 28, 2015, is presented on Figure 3. Groundwater analytical results are summarized in Table 2 and the groundwater laboratory analytical reports and well completion diagrams are included as Attachments A and B, respectively. Additional temporary monitoring wells may be installed in order to establish downgradient points of compliance. Quarterly groundwater monitoring at the temporary monitoring locations will be conducted until BTEX concentrations remain below COGCC groundwater standards for four consecutive quarters.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

The excavation has been backfilled with clean soil and graded to match the adjacent topography. Kerr-McGee's tank battery remains at the site. Reclamation activities at the site will be compliant with COGCC regulations.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☒ Y ☐ N If yes, describe:

Impacted soil was left at the base of the excavation and will be addressed in-place. Temporary monitoring/remediation wells have been installed to assess groundwater impacts. Soil and groundwater analytical results are summarized in Tables 1 and 2, respectively. The analytical laboratory reports are included as Attachment A.

Final disposition of E&P waste (land treated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

Impacted soil was transported to the Front Range Regional Landfill in Erie, Colorado for disposal. Impacted groundwater was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 7/15/2014	Date Site Investigation Completed: TBD	Remediation Plan Submitted: _____
Remediation Start Date: 7/15/2014	Anticipated Completion Date: 4/15/2017	Actual Completion Date: _____

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Phillip Hamlin

Signed: [Signature] Title: Senior HSE Representative Date: 12/6/15

OGCC Approved: _____ Title: _____ Date: _____